Hypothesis of mucilage-assisted dispersal of *Drosera* seeds

Robert Gibson • 5 Kristen Close •Cardiff Heights •NSW, 2285 • Australia • robert.gibson@environment.nsw.gov.au

Several *Drosera* taxa occur in seasonally wet herbfields on the upper slopes of isolated granite outcrops in inland South Western Australia. These habitats are naturally irrigated by runoff from adjacent rock surfaces. Many of these sundews that grow here, particularly rosetted tuberous *sundews* (*Drosera* subgenus *Ergaleium* section *Erythrorhiza*) and fan-leaved sundews (*D.* subgenus *Ergaleium* sect. *Stolonifera*) produce spherical seeds around 1 mm diameter that lack obvious surface characters to readily facilitate dispersal to other granite outcrops. Yet these sundews are common components of these habitats in the region. How then did these sundews spread across the landscape when their seed appear to be poor candidates for long-distance dispersal?

It has been suggested that perhaps foraging water birds may have helped spread sundew seeds that have been entrained in mud that temporarily adheres to their feet (Lowrie 1988, pers. comm.). Or seed may be dispersed by strong winds (Lowrie 2014: vol. 1, p. 338). Such events have likely occurred, however another factor contributing to seed dispersal may be at play.

During fieldwork in this part of the world over the last 20 years I have enjoyed visiting granite outcrops where large populations of sundews, such as *D. bulbosa* subsp. *bulbosa*, *D. lowriei*, and *D. macrophylla* subsp. *macrophylla* occur. Curiously many individual populations of *D. bulbosa* subsp. *bulbosa* and *D. lowriei* have remarkably uniform leaf size, shape, and color and which vary noticeably in morphology from adjacent but isolated populations.

On these granite outcrops tuberous sundews often grow sympatrically with a range of other geophytes, including the exotic *Romulea rosea* (Iridaceae). These habitats are frequented by a range of birds, including Galahs (*Eolophus roseicapilla*) that feed on seeds of herbs and bulbs. During my visits I have occasionally observed the dehiscence of some *Drosera bulbosa* and *D. macrophylla* seed directly onto bedewed leaves of the same or adjacent rosettes where the seeds become coated in mucin (Fig. 1).

Mucin produced by the insect-trapping glands on the leaves of sundews consists largely of an aqueous solution of polysaccharides (Rost & Schauer 1977). After desiccation and rehydration the mucin once-again become sticky.

I propose that in addition to the water-bird transport hypothesis, that large round seeds of some sundews have been periodically spread between granite outcrops by other birds, such as parrots. In their search for food they have sometimes had mucin-coated *Drosera* seed adhere to their bodies which they have occasionally transported to other suitable but isolated habitat. Sundew seed may be collected by birds walking directly on live rosettes already with fresh seeds on them. Or perhaps birds walk first on live rosettes, picking up mucin, then onto ground with seeds on it. Or even perhaps birds collect older seeds with a rehydrated coating of mucin?

If correct, this mechanism increases the number of options in which chunky, relatively heavy sundew seeds may occasionally be successfully dispersed to new areas of suitable habitat to found new populations. Such successful dispersal events would likely occur only very rarely but appears to be supported by the presence of greater morphological variation between, rather than within, these isolated populations. This seed dispersal hypothesis may apply to other *Drosera* taxa around the World.

Figure 1: *Drosera bulbosa* subsp. *bulbosa* (and *D. glanduligera*) on a granite outcrop near Hyden. Some seed has been shed directly onto active leaves.

Acknowledgement: I thank Allen Lowrie for discussions on the subject of *Drosera* dispersal that have kept me thinking about this interesting topic.

References

Lowrie, A. 2014. Carnivorous Plants of Australia: Magnum Opus. Redfern Natural History Productions, Poole.

Rost, K., and Schauer, R. 1977. Physical and chemical properties of the mucin secreted by *Drosera capensis*. Phytochemistry 16: 1365-1368.